of this investigation includes data from three cities, Birmingham, Detroit and Pittsburgh—cities in which the unemployment rate was high and the population examined mainly one whose standards of living had been definitely lowered by the economic depression.

Control groups consisted of intermingled families still obtaining adequate food, clothing and shelter, and of families which even prior to the economic depression might be considered as having lived below the comfortable economic standard. These two groups may be considered as having experienced no economic changes despite the depression. The significance of this is brought out in the conclusions reached by the investigators, viz., that "The highest illness rate is reported by a group which was in reasonably comfortable circumstances in 1929 but which had dropped to comparative poverty by 1932; their rate is 60 per cent higher than that of their more fortunate neighbors who were equal in economic status in 1929 but suffered no drop in income by 1932."

From these findings we may presume that whatever influence the economic depression will have on the gross mortality rate will be dependent on the size of the group which has experienced the greatest drop in the standard of living. Perhaps our present low mortality rate is the result of a successful effort on the part of our social relief agencies in keeping this group comparatively small during the period of economic readjustment. It remains for the future to determine whether such an optimistic conclusion is justified.

1136 West Sixth Street.

HYMAN MILLER,
Los Angeles.

ON ENZYME FORMATION

The recent work of Stephenson and Stickland[1,2] affords a nice example of what Sir F. G. Hopkins has called the "birth of an enzyme." When *B. coli* is grown in the presence of formate, an enzyme is produced which will accelerate the decomposition of this molecule. When these organisms are transferred to an N-free medium, preventing growth, the formate-oxidizing property is retained. However, if the enzymes are grown in the absence of formate, and then transferred to an N-free medium which contains formate, there is no such reaction. The organism must be in contact with formate *during growth*. These experiments exclude the possibility of selective survival, sometimes invoked to explain adjustment of culture to new types of media.

The phenomenon is not new. Dienert[3] showed in 1900 that if yeast, which does not ferment galactose, is inoculated into a glucose-galactose medium, it develops the capacity to ferment the latter in about twenty-four hours. Von Euler and Jansson[4] found that in this case, too, presence of galactose during the growth phase is essential.

H. Fink has studied an interesting case in point.[5] Top yeast is characterized by a four-band cytochrome spectrum, bottom yeast by a two-band. One variety can be transformed into the other by using a very small inoculum, and maintaining, under aerobic conditions, to get top yeast, or anaerobic conditions for a yield of bottom yeast.

In these instances the chemical character of the cell has been altered by the chemical environment, and new enzymes have been produced by the "stimulus" of new types of food molecules.

Department of Physiology,
Stanford University.

J. FIELD,
Palo Alto.

CONE-NOSE BITES—THEIR EFFECTS

The bite of the western blood-sucking cone-nose *Triatoma protracta* (Uhler) has been reported by physicians, health officers, and others as causing serious systemic disturbances, as well as swellings, welts, red blotches, and eruptions on the bodies of persons bitten. The writer, working under the direction of Professor W. B. Herms, of the Division of Entomology and Parasitology of the University of California, has for some time been engaged in studies of the anatomical aspects of this insect. During the investigation certain observations have been made which are thought to be of special interest and importance to practicing physicians and those concerned with public health problems.

In the laboratory the insects were kept alive and reared through their nymphal stages to the adult by feeding them on mammalian blood obtained from experimental animals, such as rats, mice, and rabbits. The bugs sucked blood readily from these animals, apparently without causing them any pain or harm. No fatalities ever occurred and no spots, marks or blotches were noted at or around the point of entry of the mouthparts or setae. This observation led the writer to suspect that the effects of the bites are far less serious than generally believed. In order to obtain first-hand information on this point, he allowed himself to be bitten several times.

A bug was placed on the back of the hand and immediately it attacked the skin and began to suck blood. The pain accompanying the penetration of the skin was less than that caused by the prick of a fine needle and was hardly perceptible. Two hours later another bug of the same species was allowed to bite, this time on the palm of the hand. The bug experienced no difficulty in driving its stylets through the thick skin and it sucked blood until its body became bloated and pear-shaped, but no pain was felt. At intervals of thirty minutes three more bugs were allowed to feed successively on the same hand; each time with the same results.

After a period of two weeks the experiment was repeated: this time with a bug which had been

1 Stephenson, M., and Strickland, L. H.: Biochem. J., 25:205, 1931.

2 Stephenson, M., and Strickland, L. H.: Biochem. J., 26:712, 1932.

3 Dienert, F.: Ann. Inst. Pasteur, 14:137, 1900.

4 Von Euler, H., and Jansson, B.: Ztschr. f. Physiol. Chem., 226:169, 1927.

5 Fink, H.: Ztschr. f. Physiol. Chem., 210:197, 1932.

sent in to the department from a town where the infestation of cone-noses in a certain house was said to be particularly severe. The inhabitants had been bitten on several occasions, and reported itchings, swellings, and general nervous disturbances as results of the bites. The writer in this instance also felt no ill effects.

The validity of some of the reports concerning the serious effects of cone-nose bites can hardly be questioned, but they are probably frequently exaggerated. The finding of a big black bug over half an inch long in the house or in one's bed is likely to cause an "itchy" feeling, or to have a "paralyzing" effect on the finder, even without his having been bitten. It is also a well-known fact that some individuals are more sensitive than others to insect bites, poison oak and other irritants. A sensitive individual bitten by a cone-nose will probably show many, or perhaps all, of the symptoms reported, while a less sensitive person would not react at all.

The danger of cone-noses, however, should not be underestimated, as trypanosomiasis, various other diseases and secondary infections may be caused either by contamination or bites of these insects.

521 Cedar Street,
St. Peter, Minnesota.

J. A. ELSON,
St. Peter.

THE RÔLE OF GLYCIN IN MUSCLE METABOLISM

The large group of myopathies, of which progressive muscular dystrophy is an outstanding example, has been looked upon for some little time as essentially a disturbance in muscle metabolism.

As early as 1870[1] it was known that certain myopathies were associated with a severe disturbance in creatinin excretion, as indicated by a diminished daily output.

In 1909, Levene and Kristeller[2] found in cases of progressive muscular dystrophy that there was not only a low creatinin, but a high creatin output, which was increased by a larger intake of protein in the diet. In other words, these patients had a lowered or diminished tolerance to creatin.

Recently a number of investigators have reported metabolic studies in this field with special reference to glycin administration. Kostakow and Slauck[3] have reached the conclusion that glycin, the simplest alpha amino-acid, plays a very important rôle in muscle physiology. Their studies have convinced these authors that in progressive muscular dystrophy the body has lost the ability to utilize creatin, regaining this capacity under the influence of glycin. Therefore, glycin is of benefit in muscular dystrophy and the authors think that the glycin treatment has far-reaching possibilities.

This work had been greatly stimulated by the efforts of Brand, Harris, Sandberg, and Ringer,[4] who reported in 1929 that when glycin is fed to patients with progressive muscular dystrophy, an appreciable increase in creatin excretion takes place; indicating, in all their experiments, that there is a special and significant relationship of glycin to creatin metabolism.

Thomas, Milhorat, and Techner[5] repeated these experiments, and fed glycin over prolonged periods of time to various patients with involvement of the muscular system; and they reported that the administration of this amino-acid had a marked therapeutic effect in some cases of progressive muscular dystrophy. In cases showing clinical improvement with treatment, there was an associated drop in creatin excretion with a rise in creatinin.

Remen,[6] and Boothby,[7] working with cases of myasthenia gravis, have shown encouraging results with the use of glycin, and glycin together with ephedrin.

Harris and Brand,[8] in discussing their cases of myopathy after prolonged glycin administration, are fairly conservative in the estimation of their clinical results, but agree that this type of investigation has yielded information both interesting and extremely worth while.

The *Lancet*,[9] in an editorial discussion on the muscular dystrophies, does not believe that this particular field of medicine is likely to be enlightened in the way of therapy from clinical studies alone, and that chemical investigation in these conditions is an uncultivated field which will repay any labor spent upon it. In agreement with Harris and Brand, "this statement is not quoted to minimize the important clinical contributions of the earlier investigators, but rather to indicate along what lines further progress probably lies."

1930 Wilshire Boulevard.

LEO J. ADELSTEIN,
Los Angeles.

1 Rosenthal, M.: Handbuch der Diagnostik und Therapie der Nerven-Krankheiten, Erlangen, 1870.
2 Levene, P. A., and Kristeller, L.: Am. J. Physiol., 24:45, 1909.
3 Kostakow, S., and Slauck, A.: Glycine Treatment of Progressive Muscular Dystrophy. Deutsche Med. Wchnschr., 59:169 (Feb. 3), 1933.
4 Brand, E., Harris, M. M., Sandberg, M., and Ringer, A. I.: Am. J. Physiol., 90:296, 1929.
5 Thomas, K., Milhorat, A. T., and Techner, F.: Ztschr. f. Physiol. Chem., 205:93, 1932.
6 Remen, L.: Deutsche Ztschr. f. Nervenh., 128:66, 1932.
7 Boothby, W. M., and others: Proc. Staff Meet., Mayo Clinic, 7:557 and 737, 1932.
8 Harris, M. H., and Brand, E.: Metabolic and Therapeutic Studies in the Myopathies, J. A. M. A., 101:1047 (Sept. 30), 1933.
9 The Muscular Dystrophies: Editorial, Lancet, 2:1179, 1925.

Local Anesthetic for Nose and Throat.—From a study of the use of the hydrochlorid of piperidinopropanedial diphenylurethane (diothane) as a local anesthetic for the nose and throat, Stitt concludes that the drug, if properly used, is a satisfactory local anesthetic to replace cocain for all routine uses in the nose and throat. It may be used in considerably lower concentrations than cocain, although the onset of anesthesia is somewhat slower. The resultant anesthesia is more lasting than that produced by cocain and frequently much more striking. Its action on the ear drum allows an almost painless paracentesis. In a series of several hundred cases in which hydrochlorid of piperidinopropanedial diphenylurethane has been used, there have been no signs of toxicity and the drug has not produced the undesirable reactions sometimes found with cocain. It is safe for routine use as a spray to relieve pain after tonsillectomy and is preferred for this purpose to acetylsalicylic acid.—*Annals of Otolaryngology, Rhinology and Laryngology.*